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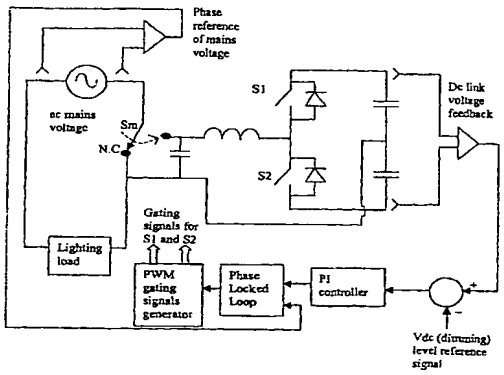
(54) Title: APPARATUS AND METHOD FOR PROVIDING DIMMING CONTROL OF LAMPS AND ELECTRICAL LIGHTING SYSTEMS



(57) Abstract: There is disclosed an energy-saving dimming method and apparatus that can be used to convert a wide range of existing "non-dimmable" electric lighting products and systems into "dimmable" ones. Examples of non-dimmable electric lighting systems are (i) high-pressure and low-pressure discharge lamps powered either by magnetic ballasts or by some electronic ballasts, (ii) incandescent lamps and (iii) a group of electric lighting systems. Based on a new integrated approach of a voltage-vector control and reactive-power control concept, the voltage applied to the lighting systems can be varied smoothly without handling the real-power of the lighting system. Consequently, the proposed dimming device and method can be used as a general-purpose, energy-saving dimming approach to the dimming of a wide range of "non-dimmable" electric lighting systems. By inserting a voltage vector through an energy-efficient switched-mode reactive-power-control circuit, the resultant voltage can be controlled and varied as a variable and controllable voltage source for dimming many electric lighting systems such as existing magnetic ballast driven gaseous discharge lamps systems and incandescent lamps.

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